Wzzard™ Sensing Platform

Intelligent Edge Nodes

Operation Manual

B+B SmartWorx®

International Headquarters
B&B Electronics Mfg. Co. Inc.
707 Dayton Road
Ottawa, IL 61350 USA
Phone (815) 433-5100 -- **General Fax** (815) 433-5105
Website: **www.bb-elec.com**
support@bb-elec.com

European Headquarters
B&B Electronics
Westlink Commercial Park
Oranmore, Co. Galway, Ireland
Phone +353 91-792444 -- **Fax** +353 91-792445
Website: **www.bb-europe.com**
techsupport@bb-elec.com

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ABOUT THE WZZARD SENSING PLATFORM

WIRELESS CONNECTIVITY WHERE YOU NEED IT

The Wzzard™ intelligent wireless sensor platform makes it quick and easy to connect sensors and communicate their data to your application, on your network or on the Internet, for visualization, analytics or integration into business applications.

The Wzzard platform connects to a vast range of industry-standard sensors. It uses Intelligent Edge Nodes and a wireless SmartMesh IP network to transmit sensor data to the Spectre Network Gateway. The Spectre Network Gateway can connect to the Internet via wired connections or the cellular data network.

Wzzard Intelligent Edge Nodes accommodate external sensors with a wide variety of sensor interface options, including general purpose analog inputs, digital input/output and thermocouple. They can also contain internal sensors like an accelerometer, depending upon the model number.

Secure, Reliable and Highly Scalable Wireless Networking

The Wzzard platform uses 802.15.4e wireless SmartMesh IP networking technology to deliver reliable, resilient and scalable communication with advanced network management and comprehensive security features. The platform uses full SmartMesh IP networking and time-synchronized channel hopping to provide up to 99.999% connectivity, even in the most demanding RF environments.
The Wzzard wireless sensor platform enables rapid network deployment and expansion. New nodes may be added at any time, and the SmartMesh network dynamically self-configures as new nodes are added or removed. This process is a function of the mesh network itself, and does not need to be controlled by the network gateway.

Easy Configuration and Installation

Configuration of the Wzzard sensor platform is easy via iOS or Android smart phones or tablets. Using the Wzzard app, your handheld devices can configure the Wzzard Intelligent Edge Nodes over their Bluetooth LE connections. The intelligent edge nodes can be configured with calibration and scaling information, eng. units, friendly names, geolocation and other descriptive information. The MQTT-SN protocol is used to transport sensor data to the network gateway. MQTT-SN is a highly efficient publish/subscribe protocol optimized for sending sensor data over wireless networks.

The platform simplifies physical installation as well. The Wzzard Intelligent Edge Nodes can be attached to any surface using screws or their embedded magnetic bases. The IP67-rated, fiber reinforced polyester PBT housing and the ability to connect to external sensors via conduit fitting cable gland or M12 connector make the units deployable in virtually any industrial or commercial environment.

Intelligence at the Network Edge

The Wzzard wireless platform places intelligence at the network edge. The Wzzard Intelligent Edge Nodes can be configured to communicate data only when specified threshold or alert levels are exceeded. When reporting, they can associate useful information like geo-location, device name and uptime. This eliminates unnecessary network traffic, eases the processing burden on upstream resources, and cuts the cost of cellular data plans when the Gateway is using the cellular data network.

Thanks to low-power wireless technology and programmable time synchronization, the Intelligent Edge Nodes can operate for up to five years on just two AA lithium batteries.

The Spectre Network Gateway

The Spectre Network Gateway connects to the SmartMesh IP wireless mesh network and the Wzzard Intelligent End nodes through an integrated 802.15.4e radio. The Spectre Network Gateway receives the incoming data stream from edge nodes in MQTT-SN format and converts the information into MQTT protocol for transport to an MQTT broker on your network or on the Internet.

Uniquely designed with open source LINUX architecture, the Spectre Network Gateway is customizable through installation of software plug-in modules. Users can create their own plug-in modules with common LINUX commands and scripts, or add them from B&B's existing library. Plug-in modules are available for establishing communications with the MQTT broker within a number of IoT application platform providers, including Axeda, Xivley, ILS and SeeControl.

The Spectre Network Gateway is built for plug-and-play simplicity with extensive remote management, deployment and customization options. It connects Ethernet equipment and other devices to the Internet or intranet via either cellular 3G or 10/100 wired Ethernet. The standard configuration includes a 10/100 Ethernet port, USB host port, binary input/output (I/O) port and an 802.15.4e radio. It also has an auxiliary port that can be configured for other purposes, like Ethernet or RS-232/485/422.

Secure Connections

To ensure secure communications the Spectre Network Gateway supports the creation of VPN tunnels using IPsec, OpenVPN and L2TP. The web interface provides detailed statistics about gateway activities, signal strength, etc. The gateway supports DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS, and many other routing functions. The Spectre Network Gateway also provides diagnostic functions which include automatically monitoring the PPP connection, automatic restart in case of connection losses, and a hardware watchdog that monitors the Spectre Network Gateway status.

CONTENTS OF PACKAGE

The package includes:

- Wzzard Intelligent Edge Node
- Sensor wire harness cable - conduit connection models only
- 2 3.6V AA Thionyl Chloride Lithium Batteries
- External Antenna (some models)
- Quick Start Guide

HARDWARE INSTALLATION

CONNECTING YOUR SENSOR

CONNECTING YOUR SENSOR WITH CONDUIT MODELS: ANALOG AND DIGITAL

Thread the wire harness through the conduit.

Plug the included wire harness into the receptacle on the circuit board inside the node.

Connect your sensor to the wires running from the node's conduit. Consult the charts below for wire colors and connections.

WIRING FOR WZZARD INTELLIGENT EDGE NODES WITH SMARTMESH IP – CONDUIT MODELS

	1 Brown	2 Red	3 Pink	4 Yellow	5 Green	6 Blue	7 White	8 Gray
WSD2CTJ	3.3V					DO	GND	GND
WSD1CTJ	3.3V					DO	GND	GND
WSD2CTK	3.3V					DO	GND	GND
WSD1CTK	3.3V					DO	GND	GND
WSD2XV0	3.3V							GND
WSD1XV0	3.3V							GND
WSD2CA2	3.3V	AIN1	GND	AIN2	GND	DO	3.3REF	GND
WSD1CA2	3.3V	AIN1	GND	AIN2	GND	DO	3.3REF	GND
WSD2CD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND
WSD1CD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND
WSD2CA3	3.3V	AIN1	GND	AIN2	GND	AIN3	GND	GND
WSD1CA3	3.3V	AIN1	GND	AIN2	GND	AIN3	GND	GND
WSB1CTJ	3.3V					DO	GND	GND
WSB1CTK	3.3V					DO	GND	GND
WSB1CA2	3.3V	AIN1	GND	AIN2	GND	DO	3.3REF	GND
WSB1CD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND

3.3V = 3.3V power input
3.3REF= 3.3V output reference
AIN1= Analog Input #1
AIN2= Analog Input #2
AIN3= Analog Input #3
DO = Digital Output
DIN1= Digital Input #1
DIN2= Digital Input #2
D01= Digital Output #1
D02= Digital Output #2
GND= Ground Input

WIRING FOR WZZARD INTELLIGENT EDGE NODES WITH SMARTMESH IP – M12 MODELS

	1 White	2 Brown	3 Green	4 Yellow	5 Gray	6 Pink	7 Blue	8 Red
WSD2MA2	3.3V	AIN1	GND	AIN2	GND	DO	3.3REF	GND
WSD1MA2	3.3V	AIN1	GND	AIN2	GND	DO	3.3REF	GND
WSD2MD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND
WSD1MD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND
WSD2MA3	3.3V	AIN1	GND	AIN2	GND	AIN3	GND	GND
WSD1MA3	3.3V	AIN1	GND	AIN2	GND	AIN3	GND	GND
WSB1MA2	3.3V	AIN1	GND	AIN2	GND	DO	3.3REF	GND
WSB1MD2	3.3V	DIN1	DIN2	DO1	DO2	GND	GND	GND

3.3V = 3.3V power input
3.3REF= 3.3V output reference
AIN1= Analog Input #1
AIN2= Analog Input #2
AIN3= Analog Input #3
DO = Digital Output
DIN1= Digital Input #1
DIN2= Digital Input #2
D01= Digital Output #1
D02= Digital Output #2
GND= Ground Input

WIRE COLORS FOR WZZARD INTELLIGENT EDGE NODES WITH BLUETOOTH LE (4.0)

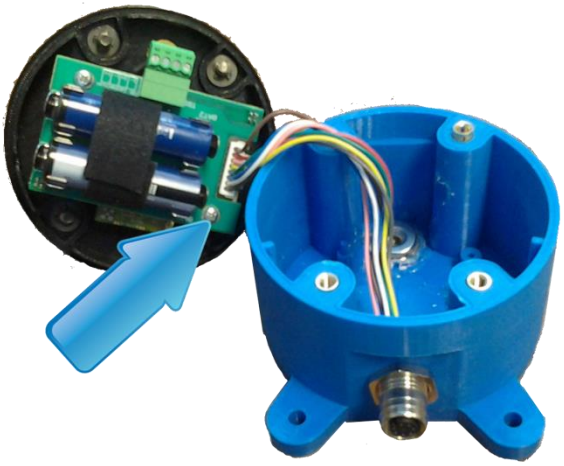
	1 Brown	2 Red	3 Pink	4 Yellow	5 Green	6 Blue	7 White	9 Gray
WSB 1MTJ								
WSB 1CTJ								
WSB 1MTK								
WSB 1CTK								
WSB 1MA2								
WSB 1CA2								
WSB 1MD2								
WSB 1CD2								

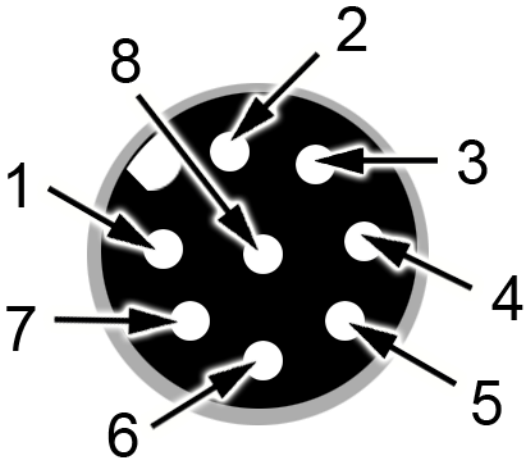
3.3V = 3.3V power input
3.3REF= 3.3V output reference
AIN1= Analog Input #1
AIN2= Analog Input #2
AIN3= Analog Input #3
DO = Digital Output
DIN1= Digital Input #1
DIN2= Digital Input #2
D01= Digital Output #1
D02= Digital Output #2
GND= Ground Input

CONNECTING YOUR SENSOR WITH M12 MODELS: ANALOG AND DIGITAL

While installing your batteries, confirm that the wire harness from the M12 port is connected to the circuit board inside in Wzzard Edge Node.

Wire your M12 cable according to the charts below.





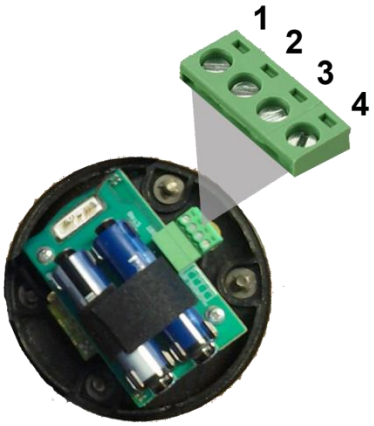
Wzzard M12 Pinout

TERMINAL BLOCK CONNECTIONS: THERMOCOUPLE

Remove the (4) screws that hold the top of the Wzzard node in place. Thread the thermocouple wires through the conduit and attach them to the terminal block.

1 = Thermocouple input #1 positive (+)
2 = Thermocouple input #1 negative (-)
3 = Thermocouple input #2 negative (-)
4 = Thermocouple input #2 positive (+)

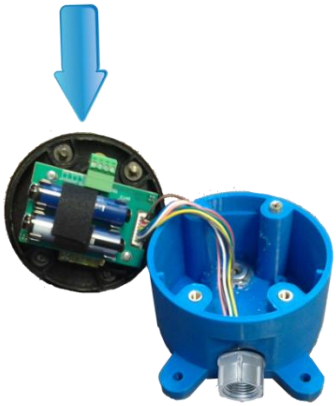
Close the Wzzard node and replace the (4) screws.



POWERING YOUR WZZARD EDGE NODE

INSTALLING BATTERIES

Remove the (4) black screws that hold the top of the node in place.
Install (2) 3.6 V AA Thionyl Chloride lithium batteries.



As with all batteries, these are a fire, explosion, and severe burn hazard. Do not burn or expose them to high temperatures. Do not recharge, crush, disassemble, or expose the contents to water. Properly dispose of used batteries according to local regulations by taking it to a hazardous waste collection site, an e-waste disposal center, or other facility qualified to accept lithium batteries.

LEDS

After you have installed the batteries the LED will begin to blink. This indicates that the Node is attempting to establish a network connection. The LED will cease blinking when a connection is made.

Status LED		
Data	Solid On	Module startup initialization, approx. 10 sec.
	Slow Blink	Attempting to establish connection with SmartMesh IP network – 1 sec on/1 sec off
	Fast Blink	Firmware Update in progress – 10 blinks per sec
	OFF	Unit is connected to wireless network

MOUNT YOUR WZZARD EDGE NODE

Wzzard nodes may be mounted either with screws or with their internal magnets.

Flange Mounting

Wzzard nodes may be mounted via their mounting ears. (M5, #10)

Magnetic Mounting

Wzzard nodes contain a powerful, internal mounting magnet. (Pull force 4.7 lbs, 2.13 kg) The magnet is in the base of the Wzzard node.

CONNECTING TO YOUR INTELLIGENT EDGE NODES VIA BLUETOOTH LE

INSTALL THE WZZARD APP ON YOUR HANDHELD DEVICE

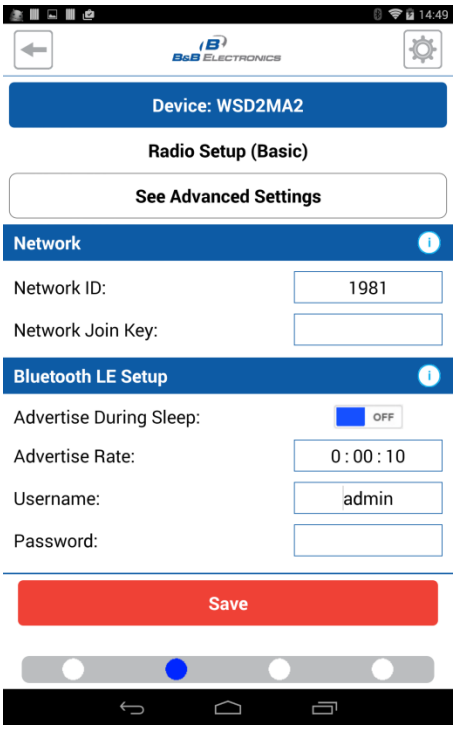
You may Install the Wzzard app on your Android or IOS handheld device. Your handheld device must be compatible with Bluetooth LE 4.0.

The Android APP version is available on Playstore

The IoS APP version is here on Apple App Store (iTunes)

The APP can also be downloaded from http://www.bb-smartsensing.com/xxxxxxxx

1. Open the Wzzard App
2. Press the “Configuration’ button on the device for at least 1 second to wake up Bluetooth radio (the LED will come on to signify this)
3. Press the device you would like to view. (This screen lets the user view Bluetooth advertisements from the Nodes.)
4. Press the Configure Device button.
5. Pair with the device. Defaults are admin/admin.
6. Press the “Radio Setup’ button to set the Network ID and Network Join Key. (These must be the same values that you enter in the corresponding network gateway.)
Press the ‘Save’ button to save the new settings.
7. Refer to the Wzzard Platform App User manual for further node programming instructions.
Documents can be found at http://www.bb-smartsensing.com



CONFIGURING YOUR WZZARD INTELLIGENT EDGE NODES

RADIO

Configuration Screen	Parameter	Parameter Range	Default Value	Description
Radio				
	Network ID	1-65534	1981	Unique identifier for the sensor network. This ID must match the gateway.
	Join Duty Cycle	0.2-99.8	25%	The percent of time that the node will be awake. A higher value allows the node to connect to the gateway faster but uses more battery current.
	Network Join Key	32 hexa-decimal characters	Wzzard Smartworx	128-bit encryption key for the network
	Advertise During Sleep	On/Off	Enabled	Enables sensor broadcast messages over the Bluetooth LE interface while the node is asleep.
	Advertise Rate	10-86400 seconds	10	Interval between broadcast messages.
	Username	16 characters	admin	Login name for configuring the node
	Password	16 characters	admin	Password for configuring the node

DEVICE CONFIGURATION

Configuration Screen	Parameter	Parameter Range	Default Value	Description
Device Configuration				
	Description	0-40 characters		User-defined text field
	Exception-based Measurement Interval	0, 10-86400 seconds	0	Determines how frequently the node will wake up to check for an exception
	Publish Interval	10 seconds to 23:59:59 hours	60	Determines the interval between publishes to the broker.

GEO LOCATION

Configuration Screen	Parameter	Parameter Range	Default Value	Description
Geo Location				
	Latitude	-90 to 90 degrees	0.0	Geographical location of the sensor
	Longitude	-180 to 180 degrees	0.0	Geographical location of the sensor
	Elevation	-999999.9 to 999999.9	0.0	Elevation of the sensor
	Sensor Label	32 characters	geoloc	User defined text field to describe the sensor

ANALOG INPUTS

Configuration Screen	Parameter	Parameter Range	Default Value	Description
Analog Inputs				
	Sensor Enable	On/Off	On	Enables publishing of the sensor data to the broker
	Analog Input Type	0-20mA, 4-20mA, 0-5V, 1-5V	0-5V	The type of sensor connected to the input
	Sensor Label	32 characters	ain1	User-defined text field to describe the sensor
	Measurement Unit	8 characters		Engineering unit of measure
	Sensor Span Point	-999999.9 to 999999.9	5.0	The value that is reported when the input is at the maximum value
	Sensor Zero Point	-999999.9 to 999999.9	0.0	The value that is reported when the input is at the minimum value
	Enable Exception	On/Off	On	Enables publishing of the sensor data to the broker when an alert level is reached
	Alert High	-999999.9 to 999999.9		The node will initially send an update to the broker when the input exceeds this value. The node will subsequently send 5 more updates at 1 minute intervals to the broker.
	Alert Low	-999999.9 to 999999.9		The node will initially send an update to the broker when the input exceeds this value. The node will subsequently send 5 more updates at 1 minute intervals to the broker.

	BLE Advertisement Enable	On/Off	On	When enabled, the node will broadcast the sensor value over the Bluetooth interface.

INTERNAL TEMPERATURE

Configuration Screen	Parameter	Parameter Range	Default Value	Description
Internal Temperature				
	Sensor Enable	On/Off	On	Enables publishing of the sensor data to the broker
	Sensor Label	32 characters	temp1	User-defined text field to describe the sensor
	Measurement Unit	Cel/[degF]	C	Engineering unit of measure
	Enable Exception	On/Off	On	Enables publishing of the sensor data to the broker when an alert level is reached
	Alert High	-999999.9 to 999999.9		The node will initially send an update to the broker when the input exceeds this value. The node will subsequently send 5 more updates at 1 minute intervals to the broker.
	Alert Low	-999999.9 to 999999.9		The node will initially send an update to the broker when the input exceeds this value. The node will subsequently send 5 more updates at 1 minute intervals to the broker.
	BLE Advertisement Enable	On/Off	On	When enabled, the node will broadcast the sensor value over the Bluetooth interface.

BATTERY VOLTAGE

Configuration Screen	Parameter	Parameter Range	Default Value	Description
Battery Voltage				
	Sensor Enable	On/Off	On	Enables publishing of the sensor data to the broker
	Sensor Label	32 characters	vbatt	User-defined text field to describe the sensor
	Measurement Unit	Volts	V	Engineering unit of measure

	Enable Exception	On/Off	On	Enables publishing of the sensor data to the broker when an alert level is reached
	Alert High	-999999.9 to 999999.9		The node will initially send an update to the broker when the input exceeds this value. The node will subsequently send 5 more updates at 1 minute intervals to the broker.
	Alert Low	-999999.9 to 999999.9		The node will initially send an update to the broker when the input exceeds this value. The node will subsequently send 5 more updates at 1 minute intervals to the broker.
	BLE Advertisement Enable	On/Off	On	When enabled, the node will broadcast the sensor value over the Bluetooth interface.

DIGITAL INPUTS

Configuration Screen	**Parameter**	**Parameter Range**	**Default Value**	**Description**
Digital Inputs				
	Sensor Enable	On/Off	On	Enables publishing of the sensor data to the broker
	Sensor Label	32 characters	din1	User-defined text field to describe the sensor
	Measurement Unit	8 characters		Engineering unit of measure
	Digital Input Type	Boolean, Count, Rate	Boolean	The type of sensor connected to the input - either a boolean input, a counter/totalizer, or a rate meter.
	Enable Exception	On/Off	On	Enables publishing of the sensor data to the broker when an alert level is reached
	Alert High	-999999.9 to 999999.9		The node will initially send an update to the broker when the input exceeds this value. The node will subsequently send 5 more updates at 1 minute intervals to the broker.
	Alert Low	-999999.9 to 999999.9		The node will initially send an update to the broker when the input exceeds this value. The node will subsequently send 5 more updates at 1 minute intervals to the broker.
	Invert Input	On/Off	Off	Changes the input from an active high input to an active low input.
	BLE Advertisement	On/Off	On	When enabled, the node will broadcast the sensor value over the Bluetooth interface.

	Enable			
	True Message	8 characters		Message that is displayed when the boolean input is true.
	False Message	8 characters		Message that is displayed when the boolean input is false.
	Minimum On Time	seconds		The minimum amount of time that the input signal must be low or high before it is registered as a valid pulse.
	Period	seconds	1	Update frequency for the rate meter.
	Multiplier	-999999.9 to 999999.9	1	The scale factor for the counter and rate meter.

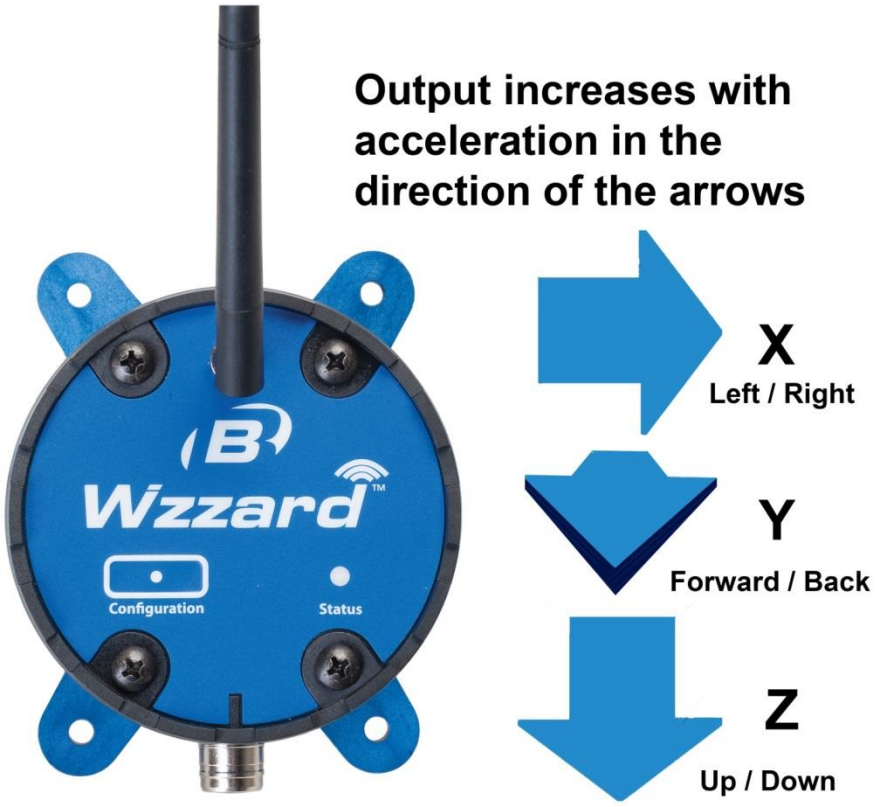
DIGITAL OUTPUTS

Configuration Screen	Parameter	Parameter Range	Default Value	Description
Digital Outputs				
	Sensor Enable	On/Off	On	Enables publishing of the sensor data to the broker
	Sensor Label	32 characters	do1	User-defined text field to describe the sensor
	Invert Output	On/Off	Off	Inverts the level of the output.
	BLE Advertisement Enable	On/Off	On	When enabled, the node will broadcast the sensor value over the Bluetooth interface.

ACCELEROMETER

Configuration Screen	Parameter	Parameter Range	Default Value	Description
Accelerometer				
	Sensor Enable	On/Off	On	Enables publishing of the sensor data to the broker
	Sensor Label	32 characters	accel1	User-defined text field to describe the sensor
	Measurement Unit	8 characters	G	Engineering unit of measure
	BLE Advertisement Enable	On/Off	On	When enabled, the node will broadcast the sensor value over the Bluetooth interface.
	Accelerometer	2G, 4G, 8G	4G	Measurement range of the

	r Granularity			accelerometer. A lower value will increase the sensitivity of the accelerometer.
	Accelerometer Interval	12.5, 25, 50, 100, 200, 400Hz	100Hz	Frequency Response of the accelerometer. A higher value will allow the accelerometer to capture faster events.



CONFIGURATION BUTTON

When you press and hold the “Configuration” button on the Node for more than 5 seconds it will:

- LED will flash quickly a couple times
- Restore the BLE login and password/encryption key/encryption enable.
- Restart the device.

This action will not reset the device back to factory settings.

When you press and hold the “Configuration” button on the node for at least 1 second but less than 5 seconds it will:

- LED will turn on (hold button until LED is seen)
- will Wake-up the device and turn on the BLE radio
- This will enable the Wzzard APP to communicate to the node

SPECIFICATIONS, INTELLIGENT EDGE NODES

Power Supply	
Sources	2 Lithium Primary Cells in parallel. Optional External Supply
External Input Voltage	3.3 VDC +/- 5%
Connectors	M12
	1/2” Conduit, sensor interface cable included; 8 wire, 26 gage, 6 ft.
Battery Life	Multiple years based on 1 min sensor sampling and reporting
Environmental -- Intended for indoor and outdoor use.	
Operating Temperature	-40 to 80 ºC
Storage Temperature	-40 to 85ºC
Operating Humidity	0 to 95% non-condensing
LED indicators	One Green LED
Data	Color = Green Blink = Attempting to establish network connection Off = Device connected to network
Enclosure Rating	
Rating	IP66-rated, fiber reinforced polyester PBT
Mounting	Mountable by use of magnets or mounting ears
Certifications	
FCC	FCC Part 15 Class A
	FCC - Part 15.247; Industry Canada - RSS210; CSA – Class 1, Div 2 Groups A, B, C, D (ANSI/UL equivalent)
CE	
EN55022	CISPR (EN55022) Class A
EN61000-6-1	Generic Standards for Residential, Commercial, & Light Industrial
EN61000-6-2	Radiated immunity 10 V/m, 80-2700 MHz (EN61000-6-2) or Equivalent
EN61000-4-2	(ESD) +/- 15kV contact, +/- 4kV air
EN61000-4-3	(RFI)
EN61000-4-4	EFT
EN61000-4-5	Surge
EN61000-4-6	CI
EN61000-4-6	Power Frequency Magnetic
EN61000-4-11	Voltage Dips & Interruptions
EN60255-21-1	Vibration
EN60255-21-2	Shock
IEC	
Shock and Vibration	IEC 60068-2-27:2008 shock, 50g, 11ms half sine wave, 18 shocks
	IEC 60068-2-6:2007 vibration, 2g, 10-500 Hz,1.5mm displacement
Radiated immunity	10 V/m, 80-2700 MHz (EN61000-6-2) or Equivalent
FCC	
FCC Part 15 Class A	
FCC - Part 15.247	

Industry Canada - RSS210
CSA – Class 1, Div 2 Groups A, B, C, D (ANSI/UL equivalent
Regulatory Approvals
ROHS and WEEE Compliant

Digital Inputs	
Voltage range	0 – 48 VDC
V_{IL}	0.97V Maximum
V_{IH}	1.8V Minimum
Pull up current	32uA
Type	Sourcing (PNP)/Sinking (NPN) Software selectable input
Isolation	None
Rate/Frequency Inputs	
Frequency	Does a 1 second measurement at each measurement/publish interval
	Can handle frequencies between 1 Hz - 1000 Hz
	Uses the falling edge or rising edge based on the Invert Enabled setting
Counter Input	
Channels	Actively counts either the falling edge (Invert enabled) or rising edge (Invert disabled)
	Can use a multiplier to convert to a unit type or count
	2 selectable/shared with Digital inputs
	Rolls over at 999999.9
Analog Inputs	
Input ranges	0-5 VDC, 0–20 mA
Accuracy @ 25ºC	Voltage: 0.10% full scale reading, 0.20% max. Current: 0.11% full scale reading, 0.24% max.
Resolution	12 bit
Input load resistance	100 Mega ohm (0-5VDC), 250ohm (0-20ma)
Thermocouple Input	
Types Supported	J and K
Ranges Supported	Type J -210 to +1,200 °C Type K -270 to +1,372 °C
Resolution	0.25°C
Accuracy	Typical +/-2°C +/- 6°C over the temperature range of -40 to 80°C
Digital Outputs	
Voltage range	0-30 VDC
Output Type	Open Drain
Output Current	Not to be less than 100ma
Protection	Current Limit Protection
Isolation	None

RADIO SPECIFICATIONS

SmartMesh IP 802.15.4e RADIO SPECIFICATIONS					
Parameter	Conditions	Min	Typ	Max	Units
Frequency Band		2,400		2,4835	GHz
Number of Channels			15		
Channel Separation			5		MHz
Channel Clear Frequency			2405 + 5*(k-11)		MHz
Modulation	IEEE 802.15.4 Direct Sequence Spread Spectrum (DSSS)				
Raw Data Rate			250		kbps
Range	25 °C, 50% RH, +2dBi Omni-Directional Antenna, Antenna 2 m	m			
	Indoor		100		m
	Outdoor		300		m
Free Space			1200		m
Receiver Sensitivity	Packet Data Error Rate (PER) = 1%			-93	dBm
Receiver Sensitivity	PER = 50%			-95	dBm
Output Power	Delivered to a 50 Ω load				
High Calibration Setting				8	dBm
Low Calibration Setting				0	dBm

BLUETOOTH LE RADIO SPECIFICATIONS						
No	Characteristics	Conditions	Min	Typ	Max	Units
1	Operation Frequency Range		2402		2480	MHz
2	Channel Spacing			2		MHz
3	Output Power	Maximum setting, measured at single ended 50ohm.		4		dBm
		Minimum setting, measured at single ended 50ohm.		-24		dBm
4	Sensitivity, High Gain Mode	High Gain Mode		-93.0	-70	dBm
		Standard Mode		-92.5	-70	dBm

THIONYL CHLORIDE LITHIUM BATTERIES (2 SUPPLIED WITH PRODUCT)	
Characteristics	Conditions
Temperature Range	-40 to 85°C
Nominal Capacity	2.4 Ah
Nominal Voltage	3.6 V
Diameter	14.5 mm
Height	50.5 mm
*Potential hazard: Do not recharge, crush, disassemble or heat above 212°F (100°C)	

MECHANICAL DRAWING

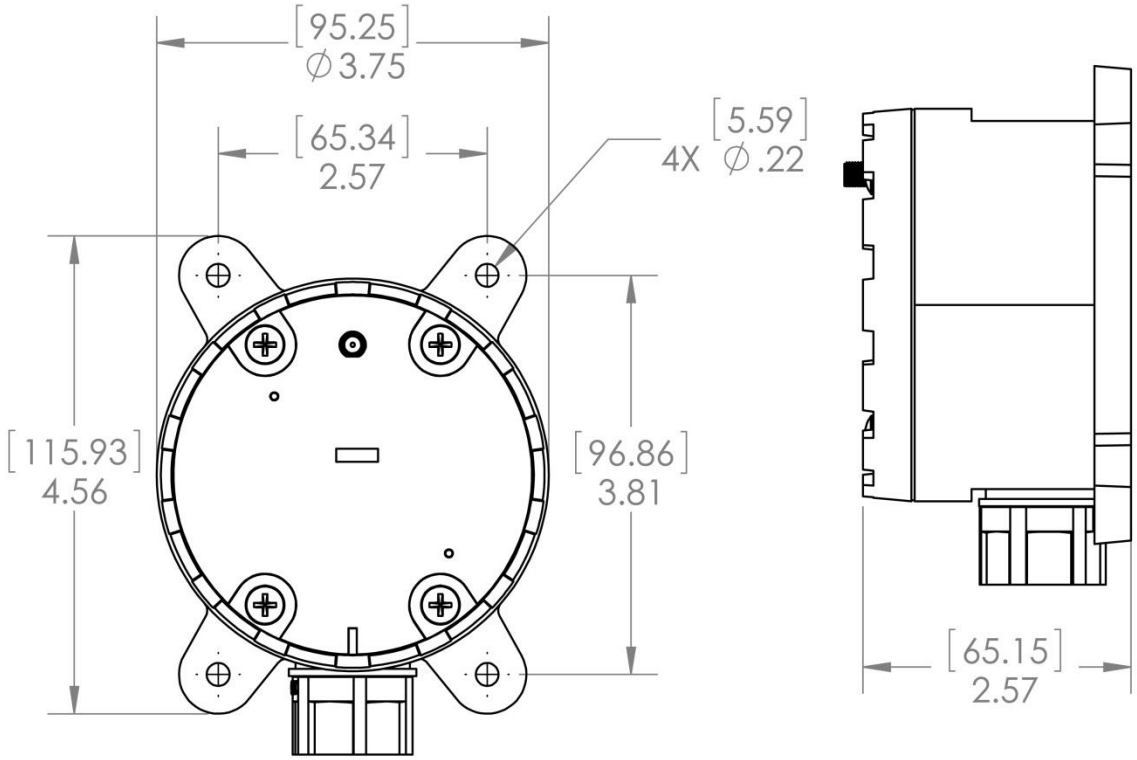


Figure 1: Mechanical drawing

MODEL NUMBERS

MODEL NUMBERS FOR WZZARD INTELLIGENT EDGE NODES WITH SMARTMESH IP AND BLUETOOTH LE

Wzzard Intelligent Edge Nodes with SmartMesh IP and Bluetooth LE	
Model Number	**Thermocouple**
WSD2CTJ	Wireless Mesh 802.15.4e; 2 Thermocouple J-type inputs, 1 Digital Output; External Antenna, Conduit Connector
WSD1CTJ	Wireless Mesh 802.15.4e; 2 Thermocouple J-type inputs, 1 Digital Output; Internal Antenna, Conduit Connector
WSD2CTK	Wireless Mesh 802.15.4e; 2 Thermocouple K-type inputs, 1 Digital Output; External Antenna, Conduit Connector
WSD1CTK	Wireless Mesh 802.15.4e; 2 Thermocouple K-type inputs, 1 Digital Output; Internal Antenna, Conduit Connector
Model Number	**Accelerometer and Temperature Sensor**
WSD2XV0	Wireless Mesh 802.15.4e Integrated Motion Sensor/Accelerometer; External Antenna
WSD1XV0	Wireless Mesh 802.15.4e Integrated Motion Sensor/Accelerometer; Internal Antenna
Model Number	**Analog Inputs**
WSD2MA2	Wireless Mesh 802.15.4e; 2-Analog Inputs, 1 Digital Output; External Antenna, M12 Connector
WSD1MA2	Wireless Mesh 802.15.4e; 2-Analog Inputs, 1 Digital Output; Internal Antenna, M12 Connector
WSD2CA2	Wireless Mesh 802.15.4e; 2-Analog Inputs, 1 Digital Output; External Antenna, Conduit Connector
WSD1CA2	Wireless Mesh 802.15.4e; 2-Analog Inputs, 1 Digital Output; Internal Antenna, Conduit Connector
WSD2MA3	Wireless Mesh 802.15.4e; 3-Analog Inputs; External Antenna, M12 Connector
WSD1MA3	Wireless Mesh 802.15.4e; 3-Analog Inputs; Internal Antenna, M12 Connector
WSD2CA3	Wireless Mesh 802.15.4e; 3-Analog Inputs; External Antenna, Conduit Connector
WSD1CA3	Wireless Mesh 802.15.4e; 3-Analog Inputs; Internal Antenna, Conduit Connector
Model Number	**Digital Inputs**
WSD2MD2	Wireless Mesh 802.15.4e; 2 Digital Inputs, 2 Digital Outputs; External Antenna, M12 Connector
WSD1MD2	Wireless Mesh 802.15.4e; 2 Digital Inputs, 2 Digital Outputs; Internal Antenna, M12 Connector
WSD2CD2	Wireless Mesh 802.15.4e; 2 Digital Inputs, 2 Digital Outputs; External Antenna, Conduit Connector
WSD1CD2	Wireless Mesh 802.15.4e; 3-Analog Inputs; Internal Antenna, Conduit Connector

MODEL NUMBERS FOR WZZARD INTELLIGENT EDGE NODES WITH BLUETOOTH LE

Wzzard Intelligent Edge Nodes with Bluetooth LE	
Model Number	**Temperature**
WSB1CTJ	Bluetooth; 2 Thermocouple J-type inputs, 1 Digital Output, Conduit Connector
WSB1CTK	Bluetooth; 2 Thermocouple K-type inputs, 1 Digital Output, Conduit Connector
Model Number	**Analog**
WSB1MA2	Bluetooth; 2 Analog Inputs, 1 Digital Output, M12 Connector
WSB1CA2	Bluetooth; 2 Analog Inputs, 1 Digital Output, Conduit Connector
Model Number	**Digital**
WSB1MD2	Bluetooth; 2 Digital Inputs, 2 Digital Outputs; M12 Connector
WSB1CD2	Bluetooth; 2 Digital Inputs, 2 Digital Outputs; Conduit Connector

MODEL NUMBERS FOR SPECTRE NETWORK GATEWAYS

Spectre Network Gateway Models	
ERT351	Ethernet Network Gateway with 2 Ethernet ports, wireless mesh 802.15.4e
RT3G-350	Cellular/Ethernet Network Gateway with 1 Ethernet port, wireless mesh 802.15.4e
RT3G-351	Cellular/Ethernet Network Gateway with 2 Ethernet ports, wireless mesh 802.15.4e
RT3G-352	Cellular/Ethernet Network Gateway with 1 Ethernet port, 1 RS-232 port, wireless mesh 802.15.4e
RT3G-354	Cellular/Ethernet Network Gateway with 1 Ethernet port, 1 RS-485 port, wireless mesh 802.15.4e

DECLARATION OF COMPLIANCE

B&B ELECTRONICS
Make The Right Connections

Declaration of Compliance

The undersigned representing the following supplier:

B&B Electronics Manufacturing Company
707 Dayton Road
Ottawa, Illinois 61350 USA

Herewith declare under our sole responsibility:

Model Numbers	WSDxxxx, WSBxxxx, where xxxx are alphanumeric characters.
Description	Wzzard Intelligent Edge Node
	Wzzard Basic Edge Node

The standards referenced below have been applied:

EMC:	EN 61000-6-2:2005	Immunity standard for industrial environments
	EN 61000-6-4:2007	Emission standard for industrial environments
	FCC Part 15 CFR Title 47:2014	
	ICES-003: 2012 Digital Apparatus (Industry Canada)	
	EN 61326-1:2012	Electrical equipment for measurement, control and laboratory use – EMC requirements
	EN 55022:2010 +AC:2011	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
	CISPR 22 Ed. 6.0b:2008	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement
	EN 55024:2010	Information Technology Equipment – Immunity Characteristics – Limits and methods of measurement
	CISPR 24:2013	Information Technology Equipment – Immunity Characteristics – Limits and methods of measurement
	IEC/EN 61000-4-2:2009	ESD Immunity
	IEC/EN 61000-4-3:2006+A2:2010	Radiated Immunity
	IEC/EN 61000-4-4:2012	EFT/Burst Immunity
	IEC 61000-4-5:2005	Surge Immunity
	EN 61000-4-5:2006	Surge Immunity
	IEC/EN 61000-4-6:2009	RF Conducted Immunity
Environmental:	EN60068-2-6:2008	Mechanical Vibration, 2G, 0.012in. displacement, 10-500 Hz
	EN60068-2-27:2009	Mechanical Shock, 50G, 11ms.

FCC Class B Notice: this device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1. This device may not cause harmful interference. 2. This device must accept any interference received, including interference that may cause undesired operation.

I hereby declare that the products named above meet the essential requirements of and are in conformity with the Standards listed.

Mike Fahrion
Director of Product Management
B&B Electronics

Date: November 20, 2014
Place: Ottawa, Illinois, USA

DECLARATION OF COMPLIANCE CE

B&B ELECTRONICS
Make The Right Connections

CE

Declaration of Conformity

The undersigned representing the following supplier:

B&B Electronics Manufacturing Company
707 Dayton Road
Ottawa, Illinois 61350 USA

Herewith declare under our sole responsibility:

Model Numbers	WSDxxxx, WSBxxxx, where xxxx are alphanumeric characters.
Description	Wzzard Intelligent Edge Node
	Wzzard Basic Edge Node

These products are in conformity with the provisions of the following directives when used in accordance with the instructions contained in the product documentation.

1999/5/EC	Radio and Telecommunications Terminal Equipment (R&TTE) Directive
2011/65/EU	Reduction of Hazardous Substances Directive

The standards referenced below have been applied:

EMC:	EN55022:2010+AC:2011	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
	EN55024:2010	Information Technology Equipment – Immunity Characteristics – Limits and methods of measurement
	EN61000-4-2:2009	ESD Immunity
	EN61000-4-3:2006+A2:2010	Radiated Immunity
	EN61000-4-4:2012	EFT/Burst Immunity
	EN61000-4-5:2006	Surge Immunity
	EN61000-4-6:2009	RF Conducted Immunity

The authorized representative located within the community maintains a copy of the technical documentation required by the directives: B&B Electronics, Westlink Commercial Park, Oranmore, Co. Galway, Ireland, Phone: +353 91 792444, Email: eSales@bb-elec.com.

I hereby declare that the product named above meets the essential requirements of, is in conformity with, and the CE mark has been applied according to, the relevant European directives listed above using the relevant sections of the European Standards and other normative documents listed above.

Mike Fahrion
Director of Product Management
B&B Electronics

Date: November 20, 2014
Place: Ottawa, Illinois, USA

B&B ELECTRONICS TECHNICAL SUPPORT

Phone: **1-800-346-3119**
(Monday - Friday, 7 a.m. to 7 p.m. CST)
Fax: **815-433-5109E-Mail:**
Email: support@bb-elec.com
Web: www-bb-elec.com